UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ZHENG J. GENG

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Appeal 2008-1153
Application 09/821,648[1]
Technology Center 2600

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Decided: January 7, 2009

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Before MAHSHID D. SAADAT, ROBERT E. NAPPI, and
SCOTT R. BOALICK, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

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DECISION ON REQUEST FOR REHEARING

Appellant requests rehearing under 37 C.F.R. § 41.52 of our Decision on Appeal entered August 11, 2008 ("Decision") wherein we affirmed the Examiner's final rejection of claims 1-14 and 16-44.

The request for rehearing is denied.

DISCUSSION

Appellant argues that our Decision, at page 13, erred by concluding:

> that it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a look-up table, as taught by Glatt, in the method taught by Nayar. (Ans. 4, 20-22.) This is no more than the combination of familiar elements according to known methods, with no unpredictable results. *See KSR*, 127 S. Ct. at 1739.

(Req. for Reh'g 2-3.) Appellant admits that "Glatt teaches mapping using a look-up table" (Req. for Reh'g 3), but contends that "Glatt only teaches how to map an image obtained from a fish-eye lens" (*id.*) and "[t]here is no teaching or suggestion in the prior art of mapping portions of an omnidirectional image from a reflective mirror to a perspective viewing window" (*id.*). Appellant further argues that "the Decision rests on the unstated assumption that the same formula and technique taught in Glatt with respect to a fish-eye lens can be used with respect to an omnidirectional image from a reflective mirror, as claimed" (Req. for Reh'g 3) and that the record does not show "how one of skill in the art would have modified the techniques and formula of Glatt to account for an image coming, not from a fisheye lens, but from a reflective mirror" (*id.*). In addition, Appellant

argues that the instant "specification describes at length the formula and techniques that would be employed to map pixels from the omnidirectional image of a reflective mirror to a perspective viewing window" (Req. for Reh'g 4) and that "[t]he Examiner has failed to demonstrate how or where this subject matter is found in the prior art and would be within the purview of one of ordinary skill in the art" (*id.*).

Appellant's arguments are not persuasive. Claim 1 broadly recites "mapping each pixel in the perspective window with a corresponding pixel value in the omnidirectional image on the image plane using a look-up table based on the configuration parameters."[2] The Specification does not impart any special meaning to the phrase "using a look-up table."[3] Indeed, the Specification does not use the term "look-up table." Instead, the Specification refers to a "mapping matrix" (Spec. paragraph [0031]) and "a simple table look-up function" (Spec. paragraph [0040]). The relevant plain meaning of "using" is "[t]o put into service or apply for a purpose; employ." The American Heritage Dictionary of the English Language (4th ed. 2000), *available at* http://www.bartleby.com/61/57/U0155700.html (last visited December 11, 2008). Claim 1 does not further define how the look-up table is to be used to perform the mapping. Thus, claim 1 merely requires a look-up table somehow to be put into service or applied for the purpose of mapping each pixel in the perspective window with a corresponding pixel

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[2] The phrase "a look-up table based on" was added to claim 1 by amendment in the Request for Continued Examination (RCE) filed December 13, 2004 based upon the previously submitted amendment in the Second After-Final Response Under 37 C.F.R. § 1.116 filed November 12, 2004.
[3] Appellant does not present any arguments with respect to the phrase "based on the configuration parameters" recited in claim 1.

value in the omnidirectional image on the image plane. Claim 1 does not require the use of any particular formulas or techniques, and we decline Appellant's invitation to import such limitations from the Specification.

Appellant does not contest the Examiner's findings that Nayar teaches generating a selectable perspective view of a portion of a hemispherical image scene using a reflective mirror and an image sensor (Ans. 3-4; Decision, Findings of Fact 1-2) and that the system of Nayar acquires an omnidirectional image on an image plane using a reflective mirror that satisfies a single viewpoint constraint, defines a perspective viewing window based on configuration parameters, and maps each pixel in the perspective viewing window with a corresponding pixel value in the omnidirectional image on the image plane (Ans. 3-4; Decision, Findings of Fact 1-6). (Req. for Reh'g *passim*.)

Nayar teaches that "there is a one-to-one correspondence between the x-y coordinate of the point of intersection with the reflector 135 of the orthographically projected ray, and the x-y coordinate of the point at which that orthographically projected ray intersects the planar light-sensitive surface of the image sensor 110" (col. 10, ll. 14-19) and that "*mapping of the image into a Cartesian-coordinate system is a simple task for persons skilled in the art*" (col. 10, ll. 29-30) (emphasis added). (Decision, Finding of Fact 3.) Thus, Nayar teaches that one of ordinary skill in the art would have known how to map a pixel in the perspective window with a corresponding pixel value in the omnidirectional image on the image plane.

As noted above, Appellant admits that "Glatt teaches mapping using a look-up table" (Req. for Reh'g 3; *see also* Ans. 4, Decision, Finding of Fact 7). In particular, Glatt teaches that coordinates are calculated and

stored in the look-up table. (Decision, Finding of Fact 7.) Glatt teaches that all coordinates for the hemispherical image coming from the fish-eye lens could be pre-calculated or, alternatively, only the coordinates for a particular area could be calculated as the area is selected and, in either case, stored in the look-up table. (*Id.*)

The Examiner articulated a reason with rational underpinnings for combining the disclosures of Nayar and Glatt. The Examiner found that "it would have been obvious to one of ordinary skill in the art to pre-calculate the coordinates of Nayar and store them in a look-up table as taught by Glatt in order to prevent the need to continuously perform complex calculations when converting a hemispherical image into a normal camera image." (Ans. 21-22.) As explained by the Examiner, "Glatt is used [in the rejection] only to teach the use of a look-up table in order to simplify the transformation of a hemispherical image to a normal camera image." (Ans. 21.) The Examiner also made clear that the rejection is not meant "to suggest that the look-up table of Glatt can be imported into the system of Nayar." (*Id.*) Rather, the Examiner's rejection used "a look-up table (as taught by Glatt) with the system of Nayar in order to provide a means to translate the hemispherical image into a normal camera image without continuously having to perform complex calculations." (*Id.*)

Thus, the combination of Nayar and Glatt does not rest on any assumption, stated or unstated, that the formulas and techniques with respect to the fish-eye lens of Glatt can be used with respect to an omnidirectional image from a reflective mirror. In addition, there is no need for one of ordinary skill in the art to modify the formulas of Glatt to account for an image coming from a reflective mirror rather than a fish-eye lens because, as

discussed *supra*, Nayar teaches that one of ordinary skill in the art would have known how to account for such an image.

Therefore, we discern no error in our conclusion that it would have been obvious to one of ordinary skill in the art at the time of the invention to have used a look-up table, as taught by Glatt, in the method taught by Nayar. No error has been shown in our conclusion that the claimed subject matter is no more than the combination of familiar elements according to known methods, with no unpredictable results. Accordingly, we decline to modify our Decision.

CONCLUSION

The request for rehearing is denied.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

REHEARING DENIED

ack

cc:

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